Release notes for ENDF/B Development photoat-071_Lu_000 evaluation

October 13, 2016

- **checkr** Warnings:

    1. A previous error halted parsing of the current section
       MAT=7100, MF= 1, MT=451 (1): Parsing stopped

       ```
       ERROR(S) FOUND IN MAT=7100, MF= 1, MT=451
           SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      165 TO      199
       ```

- **checkr** Errors:

    1. A variable is outside the allowed ENDF range
       MAT=7100, MF= 1, MT=451 (0): Variable range

       ```
       ERROR(S) FOUND IN MAT=7100, MF= 1, MT=451
           MOD =     3 OUT OF RANGE     0 -     1            RECORD NUMBER     165
       ```

    2. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=7100, MF=23, MT=501 (0): Directory (b)

       ```
       ERROR(S) FOUND IN MAT=7100, MF=23, MT=501
           SECTION 23/501 NOT IN DIRECTORY                RECORD NUMBER     201
       ```

    3. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=7100, MF=23, MT=502 (0): Directory (b)

       ```
       ERROR(S) FOUND IN MAT=7100, MF=23, MT=502
           SECTION 23/502 NOT IN DIRECTORY                RECORD NUMBER     1174
       ```

    4. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=7100, MF=23, MT=504 (0): Directory (b)

       ```
       ERROR(S) FOUND IN MAT=7100, MF=23, MT=504
           SECTION 23/504 NOT IN DIRECTORY                RECORD NUMBER     1635
       ```

    5. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=7100, MF=23, MT=515 (0): Directory (b)

       ```
       ERROR(S) FOUND IN MAT=7100, MF=23, MT=515
           SECTION 23/515 NOT IN DIRECTORY                RECORD NUMBER     1676
       ```

    6. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=7100, MF=23, MT=516 (0): Directory (b)

       ```
       ERROR(S) FOUND IN MAT=7100, MF=23, MT=516
           SECTION 23/516 NOT IN DIRECTORY                RECORD NUMBER     1710
       ```

    7. Missing a section in directory so your directory is messed up. This error will break everything else
       MAT=7100, MF=23, MT=517 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=517
         SECTION 23/517 NOT IN DIRECTORY                    RECORD NUMBER    1764
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=7100, MF=23, MT=522 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=522
         SECTION 23/522 NOT IN DIRECTORY                    RECORD NUMBER    1805
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=7100, MF=23, MT=534 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=534
         SECTION 23/534 NOT IN DIRECTORY                    RECORD NUMBER    2252
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=535 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=535
         SECTION 23/535 NOT IN DIRECTORY                    RECORD NUMBER    2273
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=536 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=536
         SECTION 23/536 NOT IN DIRECTORY                    RECORD NUMBER    2297
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=537 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=537
         SECTION 23/537 NOT IN DIRECTORY                    RECORD NUMBER    2320
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=538 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=538
         SECTION 23/538 NOT IN DIRECTORY                    RECORD NUMBER    2344
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=539 (0): Directory (b)

```
     ERROR(S) FOUND IN MAT=7100, MF=23, MT=539
         SECTION 23/539 NOT IN DIRECTORY                    RECORD NUMBER    2371
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=540 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=540
         SECTION 23/540 NOT IN DIRECTORY                    RECORD NUMBER    2400
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=541 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=541
         SECTION 23/541 NOT IN DIRECTORY                    RECORD NUMBER    2430
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=542 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=542
         SECTION 23/542 NOT IN DIRECTORY                    RECORD NUMBER    2462
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=543 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=543
         SECTION 23/543 NOT IN DIRECTORY                    RECORD NUMBER    2493
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=544 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=544
         SECTION 23/544 NOT IN DIRECTORY                    RECORD NUMBER    2523
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=545 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=545
         SECTION 23/545 NOT IN DIRECTORY                    RECORD NUMBER    2557
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=546 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=546
         SECTION 23/546 NOT IN DIRECTORY                    RECORD NUMBER    2591
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=547 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7100, MF=23, MT=547
         SECTION 23/547 NOT IN DIRECTORY                    RECORD NUMBER    2643
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=548 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=548
          SECTION 23/548 NOT IN DIRECTORY                RECORD NUMBER    2698
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=549 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=549
          SECTION 23/549 NOT IN DIRECTORY                RECORD NUMBER    2754
```

25. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=550 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=550
          SECTION 23/550 NOT IN DIRECTORY                RECORD NUMBER    2812
```

26. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=551 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=551
          SECTION 23/551 NOT IN DIRECTORY                RECORD NUMBER    2851
```

27. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=552 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=552
          SECTION 23/552 NOT IN DIRECTORY                RECORD NUMBER    2893
```

28. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=553 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=553
          SECTION 23/553 NOT IN DIRECTORY                RECORD NUMBER    2936
```

29. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=554 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=554
          SECTION 23/554 NOT IN DIRECTORY                RECORD NUMBER    3001
```

30. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=23, MT=559 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=23, MT=559
          SECTION 23/559 NOT IN DIRECTORY                RECORD NUMBER    3066
```

31. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=27, MT=502 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=27, MT=502
          SECTION 27/502 NOT IN DIRECTORY                  RECORD NUMBER    3111
```

32. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=27, MT=504 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=27, MT=504
          SECTION 27/504 NOT IN DIRECTORY                  RECORD NUMBER    3164
```

33. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=27, MT=505 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=27, MT=505
          SECTION 27/505 NOT IN DIRECTORY                  RECORD NUMBER    3218
```

34. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7100, MF=27, MT=506 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7100, MF=27, MT=506
          SECTION 27/506 NOT IN DIRECTORY                  RECORD NUMBER    3410
```

- `fudge-4.0` Warnings:

  1. generic warning message
     reaction label 0: Lu + gamma [coherent] / Product: gamma (Error # 0): Warning

     ```
     WARNING: coherentScattering is not a valid distribution component for 2-body reaction
     ```

  2. FIXME: Generic fudge unimplemented message
     reaction label 0: Lu + gamma [coherent] / Product: gamma (Error # 2): Generic unimp (c)

     ```
     WARNING: Checking not yet implemented for pointwise type data
     ```

  3. generic warning message
     reaction label 1: Lu + gamma [incoherent] / Product: gamma (Error # 0): Warning

     ```
     WARNING: incoherentScattering is not a valid distribution component for 2-body reaction
     ```

  4. FIXME: Generic fudge unimplemented message
     reaction label 1: Lu + gamma [incoherent] / Product: gamma (Error # 2): Generic unimp (c)

     ```
     WARNING: Checking not yet implemented for piecewise type data
     ```

  5. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
     summedReaction label 26: total (Error # 0): Sumrule

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 100.00%
     ```

  6. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
     summedReaction label 28: photoelectric absorption (Error # 0): Sumrule

5

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 70.22%
```

- `fudge-4.0` Errors:

    1. Calculated and tabulated thresholds don't agree
       reaction label 0: Lu + gamma [coherent] / Cross section: (Error # 0): Threshold mismatch

       ```
       WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
       ```

    2. 2-body reaction not in center-of-mass frame
       reaction label 0: Lu + gamma [coherent] / Product: gamma (Error # 1): 2-body not in COM

       ```
       WARNING: 2-body reaction not in center-of-mass frame!
       ```

    3. Calculated and tabulated thresholds don't agree
       reaction label 1: Lu + gamma [incoherent] / Cross section: (Error # 0): Threshold mismatch

       ```
       WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
       ```

    4. 2-body reaction not in center-of-mass frame
       reaction label 1: Lu + gamma [incoherent] / Product: gamma (Error # 1): 2-body not in COM

       ```
       WARNING: 2-body reaction not in center-of-mass frame!
       ```

    5. Energy range of data set does not match cross section range
       reaction label 1: Lu + gamma [incoherent] / Product: gamma / Distribution incoherentScattering - piecewise: (Error # 0): Domain mismatch (a)

       ```
       WARNING: Domain doesn't match the cross section domain: (0.0 -> 1000000000.0) vs (1.0 -> 1e+11)
       ```

    6. Calculated and tabulated thresholds don't agree
       reaction label 2: e- + e+ + Lu [electron field] / Cross section: (Error # 0): Threshold mismatch

       ```
       WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2.044e6 eV!
       ```

    7. Calculated and tabulated thresholds don't agree
       reaction label 3: e- + e+ + Lu [nuclear field] / Cross section: (Error # 0): Threshold mismatch

       ```
       WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
       ```

    8. Calculated and tabulated thresholds don't agree
       reaction label 4: e- + Lu1s1/2 / Cross section: (Error # 0): Threshold mismatch

       ```
       WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 63442. eV!
       ```

    9. Calculated and tabulated thresholds don't agree
       reaction label 5: e- + Lu2s1/2 / Cross section: (Error # 0): Threshold mismatch

       ```
       WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 10845. eV!
       ```

10. Calculated and tabulated thresholds don't agree
    reaction label 6: e- + Lu2p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 10373. eV!
    ```

11. Calculated and tabulated thresholds don't agree
    reaction label 7: e- + Lu2p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 9243.200000000001 eV!
    ```

12. Calculated and tabulated thresholds don't agree
    reaction label 8: e- + Lu3s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2470.5 eV!
    ```

13. Calculated and tabulated thresholds don't agree
    reaction label 9: e- + Lu3p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2258. eV!
    ```

14. Calculated and tabulated thresholds don't agree
    reaction label 10: e- + Lu3p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2016.1 eV!
    ```

15. Calculated and tabulated thresholds don't agree
    reaction label 11: e- + Lu3d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1650.8 eV!
    ```

16. Calculated and tabulated thresholds don't agree
    reaction label 12: e- + Lu3d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1597.8 eV!
    ```

17. Calculated and tabulated thresholds don't agree
    reaction label 13: e- + Lu4s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 497.85 eV!
    ```

18. Calculated and tabulated thresholds don't agree
    reaction label 14: e- + Lu4p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 410.19 eV!
    ```

19. Calculated and tabulated thresholds don't agree
    reaction label 15: e- + Lu4p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 355.05 eV!
    ```

20. Calculated and tabulated thresholds don't agree
    reaction label 16: e- + Lu4d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 209.38 eV!
    ```

21. Calculated and tabulated thresholds don't agree
    reaction label 17: e- + Lu4d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 199.32 eV!
    ```

22. Calculated and tabulated thresholds don't agree
    reaction label 18: e- + Lu4f5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 18.96 eV!
    ```

23. Calculated and tabulated thresholds don't agree
    reaction label 19: e- + Lu4f7/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 17.32 eV!
    ```

24. Calculated and tabulated thresholds don't agree
    reaction label 20: e- + Lu5s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 66.34 eV!
    ```

25. Calculated and tabulated thresholds don't agree
    reaction label 21: e- + Lu5p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 41.52 eV!
    ```

26. Calculated and tabulated thresholds don't agree
    reaction label 22: e- + Lu5p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 34.22 eV!
    ```

27. Calculated and tabulated thresholds don't agree
    reaction label 23: e- + Lu5d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.45 eV!
    ```

28. Calculated and tabulated thresholds don't agree
    reaction label 24: e- + Lu5d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.03 eV!
    ```

29. Calculated and tabulated thresholds don't agree
    reaction label 25: e- + Lu6s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 6.33 eV!
    ```

30. Calculated and tabulated thresholds don't agree
    summedReaction label 26: total / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
    ```

31. Calculated and tabulated thresholds don't agree
    summedReaction label 27: pair product / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
    ```

32. Calculated and tabulated thresholds don't agree
summedReaction label 28: photoelectric absorption / Cross section: (Error # 0): Threshold mismatch

```
WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 4.03 eV!
```

- `xsectplotter`   Warnings:

1. Encountered runtime warning in xsectplotter or Fudge or matplotlib
Error: RuntimeWarning

```
stderr while processing crossSection

/usr/local/lib/python2.7/site-packages/matplotlib-1.3.1-py2.7-linux-x86_64.egg/matplotlib/pyplot.py:412: Runtime
... [3 more lines]
```